

## Experimenting with Plants

### Overview:

In this lesson, students will learn about the scientific method. Students will then have the opportunity to plan and conduct two science experiments involving plants.

### Procedure:

Part One: Whole-Group Instruction:

- Show students the Brain Pop Jr. video about the scientific method.
- Identify and define key parts of the scientific method: Question, hypothesis, independent variable, dependent variables, data and conclusion.
- Students can sequence word cards with the parts of the scientific method on them.
- Model planning an experiment using a similar topic and guiding students through each part of the process.

Part Two: Independent Work/Collection of Evidence:

- One student at a time complete pages 1-2 of the first science experiment (see pages 4-5 of this lesson plan).
- Have students choose which type of seeds to plant, planting the seeds in separate flowerpots and place one plant in direct sunlight and the other plant in a dark location.
- Student will construct two graphs using graph paper or pre-labeled graphs (one graph per plant) to track the growth of the plants each day.
- Student will measure the height of each plant once a day for two weeks.
- After two weeks, the student will complete page 3 of the science experiment (see page 6 of this lesson plan) to analyze his or her graph and draw a conclusion.
- Student will repeat this process with a similar experiment so the topic will be familiar (see pages 7-9 of this lesson plan).

### ASOL Covered in this Activity:

**3S-SI 1:** The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which  
j) conclusions are drawn.

**5S-SI 1:** The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which  
f) independent and dependent variables are identified.

**8S-SI 1:** The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations which  
h) data are analyzed and communicated through graphical representation.

**HSS-SI 2:** The student will demonstrate an understanding of the nature of science and scientific reasoning and logic. Key concepts include

- b) evidence is required to evaluate hypotheses and explanations;
- c) observation and logic are essential for reaching a conclusion.

**Materials Needed:**

- Sunflower seeds
- Lima bean seeds
- 4 small flower pots (per student)
- Rulers (with centimeters)
- Science experiment packets (attached)
- Blank graph paper

**Instructional Setting:**

- Classroom
- Part one: Whole-group or small-group; Part 2: Independently

**Community Connections and/or Peer Interaction:**

- Pairs to practice measuring the length of different items.
- Purchase necessary supplies at a store
- Visit a local nursery to see seed to plant process

**Functional Activity/Routine:**

- Care for classroom plants
- Create a shopping list for necessary items
- Find price of items at store and calculate the cost of the items

**Strategies to Collect Evidence:**

- Work sample of two science experiments
- Photos of students caring for/measuring plants

**Specific Options for Differentiating this Activity:**

- Assistive technology: Incorporate key vocabulary words into augmentative communication system
- Complete graph data with pre-made graphs and Velcro pieces rather than by writing
- Picture supports and choices increased in size or eliminated from the science experiment packets
- Adapt questions to require open-ended or extended responses

Name \_\_\_\_\_ Date \_\_\_\_\_

### Planning an Experiment-1

1. Ask a question!

What question are we going to answer in this experiment?

- a. Will plants grow faster in the light or in the dark?
- b. Will plants grow faster with more water?

2. Make a hypothesis:

I think that plants will grow faster in the \_\_\_\_\_.

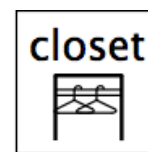
- a. light
- b. dark

3. Independent variable:

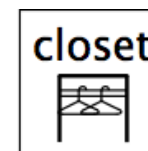
It is important to change only one thing in an experiment so we can answer our question. What will be different about the plants we use in this experiment?

- a. amount of light each plant gets
- b. amount of water we give to each plant

We need to put the plants in different spots so they will get different amount of light. Where can we put a plant in the classroom so it will get the MOST amount of light?



Where can we put a plant in the classroom so it will get the LEAST amount of light?



Name \_\_\_\_\_ Date \_\_\_\_\_

4. Dependent variables:

We need to plant the same kind of seeds to show if location effects a plant's growth. What kind of seeds will we plant in this experiment?

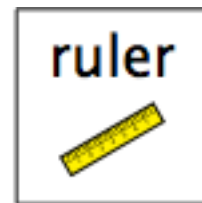
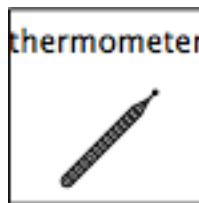


How much water will we give to the plants each morning and afternoon?

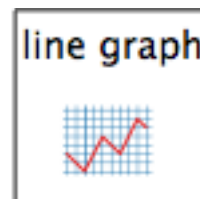
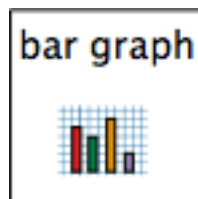
\_\_\_\_\_ mL

5. Recording Data:

What will you use to measure the growth of the plants each day?



What kind of graph can we use to keep track of the data?



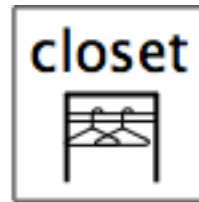
Name \_\_\_\_\_ Date \_\_\_\_\_

6. Analyzing the Data:

How tall did the plant on the windowsill grow by day 10? \_\_\_\_\_

How tall did the plant in the closet grow by day 10? \_\_\_\_\_

Which plant grew the tallest by day 10?



7. Drawing Conclusions:

Where did the lima beans grow faster?



What do plants need to grow?

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Name \_\_\_\_\_ Date \_\_\_\_\_

### Planning an Experiment-2

#### 1. Ask a question!

What question are we going to answer in this experiment?

- a. Will plants grow faster in the light or in the dark?
- b. Will plants grow faster with water?

#### 2. Make a hypothesis:

I think that plants will grow faster with \_\_\_\_\_.

- a. water
- b. no water

#### 3. Independent variable:

It is important to change only one thing in an experiment so we can answer our question. What will be different about the plants we use in this experiment?

- a. amount of light each plant gets
- b. amount of water we give to each plant

How much water will we give to the first plant each morning and afternoon?

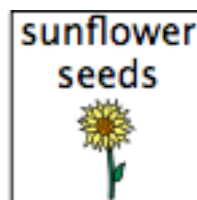
\_\_\_\_\_ mL

How much water will we give to the second plant each morning and afternoon?

\_\_\_\_\_ mL

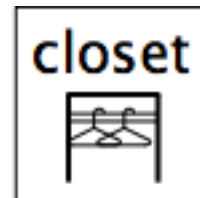
#### 4. Dependent variables:

We need to plant the same kind of seeds to show if the amount of water effects a plant's growth. What kind of seeds will we plant in this experiment?



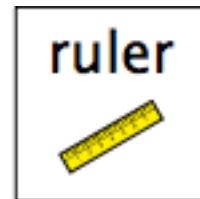
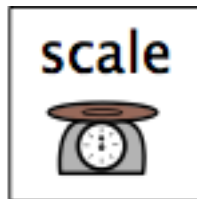
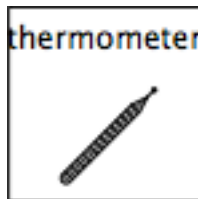
Name \_\_\_\_\_ Date \_\_\_\_\_

We need to put the plants in the same place to show if the amount of water affects a plant's growth. Where can we put the plants in the classroom so that they will get the same amount of sunlight?

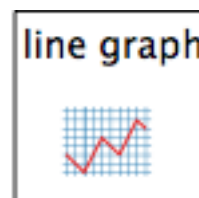
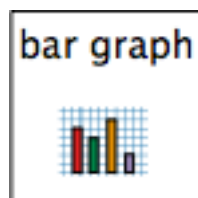


### 5. Recording Data:

What will you use to measure the growth of the plants each day?



What kind of graph can we use to keep track of the data?



Name \_\_\_\_\_ Date \_\_\_\_\_

### 6. Analyzing the Data:

How tall did the plant with water grow by day 10? \_\_\_\_\_

How tall did the plant with NO water grow by day 10? \_\_\_\_\_

Which plant grew the tallest by day 10?



### 7. Drawing Conclusions:

Which sunflower grew faster?



What do plants need to grow?

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